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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/991,453	11/14/2001	Terry Ping-Chung Lee	10016598-1	3978

7590 11/24/2004
HEWLETT-PACKARD COMPANY
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EXAMINER

DANG, KHANH

ART UNIT PAPER NUMBER

2111

DATE MAILED: 11/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/991,453

Applicant(s)

LEE, TERRY PING-CHUNG

Examiner

Khanh Dang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/08/04 amendment.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Wallach et al.

At the outset, it is noted that similar claims will be grouped together to avoid repetition.

As broadly drafted, these claims do not define any step that differs from Wallach et al.

With regard to claim 1, Wallach discloses a method for a computer having a peripheral component interconnect (PCI) system having a host bridge (208, for example) coupling a plurality of PCI slots ((PCI slots, see Fig. 3, for example) of a PCI bus to a processor (200, for example), the computer accessing base address registers (also address registers in Wallach, in full compliance with PCI specification) with firmware (in Wallach, software architecture is used to allow users to identify and

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replace failed components, upgrade outdated components, and add new functionality), and support the hot add and swap of off-the-shelf adapters), a method of identifying a failing PCI slot, comprising the steps of:

(a) creating a firmware maintained PCI resource allocation map in which addresses for PCI slots associated with the base address registers and sizes of address ranges (either the conventional 32 or 64 bit PCI slot with corresponding 32 or 64 bit BAR (Base Address Registers) for these addresses (also the BARs or Base Address Registers and sizes of address in Wallach) are mapped (resources are allocated by BIOS and mapped/configured by the configuration manager 500);

(b) updating the firmware maintained PCI resource allocation map upon the occurrence of at least of firmware being called to execute at least one of a hot plug operation and a PCI configuration space transaction (in Wallach, hot add and swap of off-the-shelf adapters are supported; the configuration manager 500 updates resource allocation when hot plug or swap occurs); and

(c) upon the host bridge logging an error address due to a failing PCI slot, identifying the failing PCI slot from the information in the firmware maintained PCI resource allocation map (in Wallach, the user is notified by software/firmware which PCI slot/adaptor is failed. In fact, this action is required by PCI Hot Plug Specification. According to the specification, the Hot Plug Service activates the Attention Indicator at anytime to call a user's attention to a particular slot. For example, the Hot Plug Service may activate the Attention Indicator when the system detects problem conditions which require user intervention at the adapter/slot. Further several form of slot identifications

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are required throughout the Hot Plug system. The first is the Physical Slot Identifier. The second form of slot identification is PCI bus and device number/address. The Hot Plug Driver is required to run the PCI configuration to query the slot status (Query Slot Status) and run the Configuration Routine). The third form of slot identification is the Logical Slot Identifier for uniquely identifying each slot).

With regard to claim 2, in Wallach, upon the occurrence of a hot plug operation for a PCI slot, a hot plug flag associated with that PCI slot is set (according the Hot Plug Specification, each slot has a Logical Slot Identifier, a parameter of Hot Plug Primitive which uniquely identifies a particular slot/hot plugged slot; and an Attention Indicator for indicating which slot/adaptor is hot plugged) and upon the host bridge logging an error address, invalidating the firmware maintained PCI resource allocation map entries associated with each PCI slot having its hot plug flag set (after hot plug, the space configuration manager must re-initialize the resource allocation, or in another word, invalidate the resource allocation map with the hot plug adapter taken into consideration).

With regard to claim 3, see explanation regarding to claim 2 above. Further, it is clear that the Identifier/Indicator or flag must be cleared after address space is reconfigured/mapped by reconfiguration by space configuration manager 500.

With regard to claim 4, it is clear that the address of every slot must be accountable for and stored in a BAR after configuration. The failing slot can only be identified when its address is known address among slot addresses stored in the BAR.

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With regard to claims 5-7, the address size must be within address space (32 bit, for example). It is clear that when address bits of a adapter/slot do not fit in a 32 bit address space or 32 bit BAR, for example, then that failing slot cannot be identified. In another word, after all known address are accounted for after configuration (address size range is known and stored in 32 bit BAR), any failing slot address that does not fit in 32 bit address space cannot be identified and is therefore, "unknown."

With regard to claims 8 and 9, see explanation regarding to claims 1-3 above.

With regard to claims 10-13, see explanation above regarding to claims 1-9 above.

Response to Arguments

Applicants' arguments filed 10/08/2004 have been fully considered but they are not persuasive.

At the outset, Applicants are reminded that claims subject to examination will be given their broadest reasonable interpretation consistent with the specification. *In re Morris*, 127 F.3d 1048, 1054-55 (Fed. Cir. 1997). In fact, the "examiner has the duty of police claim language by giving it the broadest reasonable interpretation." *Springs Window Fashions LP v. Novo Industries, L.P.*, 65 USPQ2d 1862, 1830, (Fed. Cir. 2003). Applicants are also reminded that claimed subject matter not the specification, is the measure of the invention. Disclosure contained in the specification cannot be read into the claims for the purpose of avoiding the prior art. *In re Sporck*, 55 CCPA 743, 386 F.2d, 155 USPQ 687 (1986).

With this in mind, the discussion will focus on how the terms and relationships thereof in the claims are met by the references. Response to any limitations that are not in the claims or any arguments that are irrelevant and/or do not relate to any specific claim language will not be warranted.

The Wallach 102 Rejection:

Applicants argue that "Wallach et al. does not disclose a firmware maintained PCI resource allocation map. The Examiner cites to Wallach et al's configuration manager 500 as purportedly meeting the limitation of maintaining a firmware PCI resource allocation map. Assuming, arguendo, the Wallach et al's configuration manager 500 maintains a PCI resource allocation map, nothing in Wallach et al. discloses that it does so in firmware. The present invention solves a problem in computer systems having operating systems that use firmware to access base address registers and Wallach et al. does not even discuss the use of firmware to access base." Contrary to Applicants' argument, Wallach discloses "the system components of the NetWare Operating System and an embodiment of the software components of the invention. A configuration manager 500 is responsible for managing all or some of the adapters on the PC buses 234 and 236 (FIG. 2), or 250, 252, 254 and 256 (FIG. 3). The configuration manager 500 keeps track of the configuration information for every managed adapter located on the fault tolerant computer system 100. The configuration manager 500 also allocates resources for every managed

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adapter and initializes each managed adapter's registers during a hot swap operation."

See at least column 9, lines 10-23. Further, Wallach discloses that "[t]he configuration manager 1100 saves the configuration information for each adapter 310 in a linked list of data. The configuration manager 1100 maintains this linked list of data in case an adapter 310 fails. Upon the failure of an adapter 310, the configuration manager 1100 reprograms a replacement adapter's configuration space." See at least column 17, lines 12-19. Wallach further discloses that "[f]or the embodiment of the computer shown in FIG. 3, the configuration manager 500 reprograms the configuration space and resumes the communication of each adapter located on the canister on which the adapter was swapped (state 814). Finally in state 816 the configuration manager changes each adapter's state to active." Further, "[t]he configuration manager 500 reads all of the BARs [base address registers] in the configuration space for each adapter." In addition, Wallach discloses that "the configuration manager 500 assigns the variable "board_num" the value of zero. The configuration manager 500 uses the variable "board_num" when requesting information from the NetWare Operating System driver configuration tables." Thus, it is clear that in Wallach, the PCI resource allocation map is maintained by software, and software is also used for accessing the BARs.

Applicants also argue that "[t]he Examiner, with reference to claims 5 -7, fails to cite any section of Wallach et al. as disclosing these limitations. The Examiner simply takes the position that 'it is clear that when address bits of an adapter/slot do not fit in a 32 bit address space or 32 bit BAR, for example, then that failing slot cannot be

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identified.' Applicant finds no discussion in Wallach et al. that it identifies failing PCI slots in the manner required by these limitations of claims 7 - 10 and 10. Further, these limitations require that the failing PCI slot be identified as unknown when the logged error address fails after a known address size range and nothing in Wallach et al. discloses doing so. Applicant submits that claims 5 - 7, 10 and 12 are allowable over Wallach et al. also for these reasons." In response to Applicants' argument, it is still the Examiner's position that the address size must be within address space (32 bit, for example). It is clear that when address bits of a adapter/slot do not fit in a 32 bit address space or 32 bit BAR, for example, then that failing slot cannot be identified. In another word, after all known address are accounted for after configuration (address size range is known and stored in 32 bit BAR), any failing slot address that does not fit in 32 bit address space cannot be identified and is therefore, "unknown." As a matter of fact, Wallatch discloses that "[a]s defined by the PCI specification, the base address registers (BARs) define the starting point of the I/O and memory addresses that each adapter has been allocated in system memory. Also, defined by the PCI specification, an adapter can have up to six BARs. It is up to the adapter vendor to implement one or more BARs in the adapter for I/O or memory addressing, as desired. According to the PCI specification, each of the six BAR entries in an adapter's configuration space is identified as to its resource type (bit zero indicates whether this BAR describes a memory space or I/O space). The configuration manager 500 reads all of the BARs in the configuration space for each adapter 310, looking for a BAR which describes I/O

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resources. For each such BAR, the LSL 502 configuration spaces are searched for an I/O port address which matches this BAR. This process continues until a match is found, identifying the LSL 502 configuration space which describes this adapter. If no match is found, then LSL 502 has no logical board describing this adapter, and no driver exists to service this board." See at least column 13, lines 27-46.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication should be directed to Khanh Dang at telephone number 703-308-0211.



Khanh Dang
Primary Examiner